

### 3. On a Collection of Land-ShellS from British Central Africa. By EDGAR A. SMITH, F.Z.S.

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(Plates XXXIII.—XXXV.)

The collection about to be described was presented to the British Museum by Sir Harry Johnston in 1896 and 1897, and a brief notice of a portion of it has already appeared in his book on 'British Central Africa' (pp. 363, 364). It is of special interest, as very little is known respecting the terrestrial Mollusca of this particular region. The country to the north and east, in German East Africa, has been conchologically explored by many collectors, and a very valuable report upon the fauna has been given by Dr. E. von Martens, in 1897, in a work entitled 'Beschaltte Weichthiere Deutsch-Ost-Afrikas.' Only a very few species, however, had previously been collected in Nyasaland, and reference to these has already been made by the writer in the Society's 'Proceedings' for 1891, p. 309. Although the present collection contains examples of as many as twenty-five new species out of a total of forty-four enumerated, none of them are representatives of new generic types, and the forecast given in the paper referred to has, judging by the present collection, proved to be correct in every respect<sup>1</sup>. The "interesting intermediate links connecting some of the large species of *Achatina*" have been met with, and a number of new species of other groups of Helicidæ "have been found." In working out this collection much difficulty was experienced in determining the *Achatina*. The species appear to grade one into the other, and the more examples we have, the greater the trouble becomes. The genus is spread over the greater part of Central and West Africa, as far north as Senegambia, and each district seems to produce its special race, a modification of some neighbouring form; so that the separation of species becomes more and more difficult through the discovery of intermediate links from every fresh locality. The same may be said of the *Ennea*, and indeed of most of the other groups.

The specimens were obtained by Mr. Alexander Whyte, or under his direction, at the following localities:—

(1) Nyika Plateau, 7000 feet, towards the north end of Lake Nyasa, on the west side; (2) Mount Zomba, 6000 feet; (3) Zomba Plateau, 5000 feet; (4) Mount Chiradzulu, 5000 feet; and (5) Malosa, 6000 feet, all to the south of the lake. The Masuku Plateau 6000–7000 feet, where several of the specimens were obtained, is also probably in the same region.

<sup>1</sup> The collection also contained a few slugs, including *Atoxon taniatum* Simroth (?) and a species of *Veronicella*.

## 1. STREPTOSTELE COSTULATA Martens.

*Streptostele costulata*, Martens, Weichth. Deutsch-Ost-Afrikas, p. 34, pl. ii. fig. 33.

*Hab.* Nyika Plateau, 7000 feet.

A single specimen may belong to this species. It agrees very closely with a typical example from Butumbi, but is rather smaller, more slender, and the whorls are rather higher in proportion to the width.

## 2. ENNEA (UNIPPLICARIA) HAMILTONI Smith.

*Ennea hamiltoni*, Smith in H. H. Johnston's 'British Central Africa,' p. 364 (1897).

*Ennea johnstoni*, Smith, Proc. Zool. Soc. 1893, p. 633, pl. lix. fig. 1.

*Hab.* Mount Zomba, 6000 feet; Malosa, 6000 feet.

The specimens from the latter locality are considerably larger than the types from Fort Johnston, the oblique sculpture is a trifle coarser, and the parietal denticle is entirely absent or only very faintly indicated. The form is variable, as shown by the following measurements:—

Length	27½ millim.	Width	12.
"	24 "	"	13.

## 3. ENNEA (GULELLA) LÆVIGATA Dohrn.

*Ennea lævigata*, Dohrn, Proc. Zool. Soc. 1865, p. 232; Martens, Weichth. Deutsch-Ost-Afr. p. 21.

*Hab.* Zomba Plateau; Masuku Plateau, 6000–7000 feet; Nyika Range, 7000 feet; Mount Chiradzulu.

Somewhat variable in size and in the development of the upper of the two labral teeth. This in the type is somewhat bifid or tuberculated as described by Dohrn, whereas in the specimens in the present collection it is simple, sometimes of the same size as the adjacent tooth, but sometimes a trifle larger.

## 4. ENNEA (GULELLA) VICINA, sp. nov. (Plate XXXIII. figs. 1, 2.)

*Testa breviter cylindræa, rimata, subpellucido-albida, nitida, oblique leviter striata, striis infra suturam distinctioribus; anfractus 6½, convexi, ultimus penultimo angustior, pone labrum indentatus; apertura parva, ringens, dentibus pluribus inæqualibus munita; dens parietalis magnus, lamelliformis, labro junctus; dentes columellares tres, tres supra labrum, tres ad basin; peristoma leviter incrassatum, expansum et reflexum.*

*Longit.* 7 millim., *diam.* 3½; *apertura* 2½ *longa.*

*Hab.* Mount Chiradzulu and Zomba Plateau at 5000 feet.

Allied to *E. triplicaria* Martens, but differing in the labral teeth, and also in the almost total absence of a second parietal tooth. Although depicted in the figure, Martens does not mention

the two small denticles at the base of the aperture rather far within from the margin. These occur also in the present species in the same position. The teeth on the columella are divergent and situated on a prominence. Those on the outer lip might be described as two in number, whereof the upper is somewhat irregularly bipartite.

5. *ENNEA* (*GULELLA*) *FORTIDENTATA* Smith, var.

*Ennea fortidentata*, Smith, Ann. Mag. Nat. Hist. 1890, vol. vi. p. 162, pl. vi. fig. 6; Martens, Weichth. Deutsch-Ost-Afr. p. 21.

*Hab.* Nyika Range, 7000 feet.

Generally a trifle stouter than the typical form from Mamboia, and without the minute parietal tooth above the columella.

6. *ENNEA* (*GULELLA*) *VARIANS*, sp. nov. (Plate XXXIII. figs. 3, 4.)

*Testa cylindracea, rimata, pellucida, albida, oblique tenuiter costulata; anfractus 8, lente accrescentes, sutura profunda leviter obliqua sejuncti, superiores duo (protoconcham constituentes) læves, convexi, cæteri convexiusculi; ultimus duobus præcedentibus angustior, pone labrum indentatus; apertura parva, intus quadridentata; dens parietalis unicus lamelliformis, prominens, dextrorsum concavus, prope labrum situs, alius paulo minor supra medium labri, tertius minimus ad basin apertura, quartus columellaris, maximus; peristoma utrinque expansum, subreflexum, leviter incrassatum.*

*Longit.* 6 millim., *diam.* 2; *apertura fere 2 longa.*

*Hab.* Mount Chiradzulu and Zomba Plateau, 5000 feet.

The parietal lamellar tooth is short, not extending far within, and the columellar fold is broad, jutting out prominently across the aperture. Another example in rather bad condition is somewhat longer, having a length of  $7\frac{1}{2}$  millim., although consisting of the same number of whorls.

The two specimens from the Zomba Plateau are smaller, shorter, and have only seven whorls. In other respects they agree precisely with the type. Length 5 millim., diam. 2.

7. *STREPTAXIS* *JOHNSTONI*, sp. nov. (Plate XXXIII. figs. 5, 6.)

*Testa ovata, parum obliqua, rimata, albida, lineis incrementi obliquis tenuissimis striata; anfractus  $6\frac{1}{2}$ , convexi, infra suturam crenulati, ultimus paulo descendens; apertura obliqua, longit. totius  $\frac{1}{2}$  fere æquans; peristoma vix incrassatum, leviter expansum, margine columellari reflexo.*

*Longit.* 10 millim., *diam.*  $6\frac{1}{2}$ ; *apertura  $4\frac{2}{3}$  longa.*

*Hab.* Nyika Range and Zomba Plateau.

Allied to *S. denticulatus* Dohrn and *S. pusillus* Martens. The so-called "*Ennea vitrea*" of Morelet from Angola is also very similar, yet distinct.

## 8. STREPTAXIS KIRKI Dohrn. (Plate XXXIII. figs. 7, 8.)

*Streptaxis kirkii*, Dohrn, Proc. Zool. Soc. 1865, p. 232; Martens Weichth. Deutsch-Ost-Afrikas, p. 32.

*Hab.* Zomba Plateau, 5000 feet.

## 9. HELICARION NYASANUS, sp. nov. (Plate XXXIII. figs. 9, 10.)

*Testa tenuissima, pellucida, albida, vix nitens, lineis incrementi leviter plicatis striata, depressa, ambitu subovata; spira depressa, apice obtuso, prominulo; anfractus tres, convexi, infra suturam depresso marginati, margine subcrenulato, ultimus subtus in medio membranaceus; apertura fere horizontalis, latissime lunata.*

*Diam. maj.* 16 millim., *min.* 11, *alt.* 7½.

*Hab.* Mount Chiradzulu, Masuku Plateau, 6000-7000 feet, and Nyika Range, 7000 feet.

Very thin, depressed above, membranaceous beneath at columellar margin, with somewhat plicate lines of growth.

## 10. HELICARION MASUKUENSIS, sp. nov. (Plate XXXIII. figs. 11, 12.)

*Testa H. nyasano minor, minus depressa, rotundior, minus fragilis, infra haud membranacea, lineis incrementi minus plicatis; apertura angustior, margine columellari ad insertionem incrassato, albo, reflexo, rimam umbilicalem formante, margine externo callo tenuissimo juncto.*

*Diam. maj.* 14 millim., *min.* 10⅔, *alt.* 7.

*Hab.* Masuku Plateau, 6000-7000 feet, Nyika Range, 7000 feet, Mount Chiradzulu and Zomba Plateau, 5000 feet.

The whorls, as in *H. nyasanus*, are three in number, but the spire is a little more elevated.

## 11. KALIELLA BARRAKPORENSIS Pfeiffer.

*Helix barrakporensis*, Pfeiffer, Proc. Zool. Soc. 1852, p. 156; Conch.-Cab. ed. 2, p. 415, pl. 147. figs. 20-22; Reeve, Con. Icon. fig. 816; Tryon, Man. Conch. ser. 2, vol. ii. p. 61, pl. xxvi. figs. 57, 58; Godwin-Austen, Land & Freshwater Moll. India, vol. i. pp. 2, 19, 146, pls. i., ii., v., xxxviii.

*Helix (Trochonantina) pretoriensis*, Melvill & Ponsonby, Ann. Mag. Nat. Hist. 1890, vol. vi. p. 469.

*Hab.* Mount Chiradzulu.

Occurring also in North and South India, Madagascar, Pretoria, S. Africa, and Ashanti. Specimens from these localities, which I cannot in any way separate, are in the Museum Collection. They doubtless have been transported from place to place, as seems to have been the case with the well-known *Eulota similaris* and various species of *Subulina* and *Opeas*.

## 12. THAPSIA MIXTA, sp. nov. (Plate XXXIII. figs. 13, 14, 15.)

*Testa pallide cornea, anguste perforata, depressa, orbicularis, nitida, lineis incrementi inconspicuis strisque spiralibus micro-*

*scopiciis sculpta; spira parum elata, subconvexe conoidea; anfractus  $5\frac{1}{2}$ , lente accrescentes, convexiusculi, infra suturam anguste marginati; apertura oblique lunata, margine columellari superne breviter dilatato et reflexo.*

*Diam. maj.  $7\frac{1}{2}$  millim., min.  $6\frac{1}{2}$ , alt. 4.*

*Hab.* Mount Chiradzulu.

Flatter than *T. hanningtoni*, columella more oblique and reflexion different.

13. *THAPSIA INSIMULANS*, sp. nov. (Plate XXXIII. figs. 16, 17, 18.)

*Testa minima, fusco-cornea, nitida, depressa, orbicularis, perforata, lineis incrementi tenuibus striisque spirales minutis sculpta; spira brevissime conoidea, ad apicem obtusa; anfractus  $4\frac{1}{2}$ , lente accrescentes, convexiusculi, anguste marginati, ultimus infra spiraler distinctius striatus; peristoma tenue, margine columellari leviter expanso, via reflexo.*

*Diam. maj. 5 millim., min.  $4\frac{1}{2}$ , alt. 3.*

*Hab.* Mount Chiradzulu.

Quite distinct from *T. hanningtoni* and *T. depressior* Smith<sup>1</sup> from Mamboia.

14. *THAPSIA MASUKUENSIS*, sp. nov. (Plate XXXIII. figs. 19, 20.)

*Testa angustissime semiobtecte perforata, depressa, orbicularis, tenuis, polita, fusco-cornea; spira breviter conoidea ad apicem obtusa; anfractus  $5\frac{1}{2}$ , convexi, lente crescentes, anguste marginati; apertura obliqua, lunata; peristoma tenue, margine columellari ad insertionem incrassato, albo, expanso, peculiariter reflexo, umbilicum semiobtegente.*

*Diam. maj. 9 millim., min.  $7\frac{2}{3}$ , alt.  $5\frac{1}{2}$ .*

*Hab.* Masuku Plateau, 6000–7000 feet.

The sculpture consists of faint lines of growth which are finely plicate near the suture, and very minute, almost imperceptible spiral striation.

15. *THAPSIA SIMULATA*, sp. nov. (Plate XXXIII. figs. 21, 22, 23.)

*Testa depressa, orbicularis, anguste umbilicata, solidiuscula, nitida, supra fuscescens, infra pallida; spira brevissime conoidea, ad apicem obtusa; anfractus 5, convexi, infra suturam impresse marginati, sublente crescentes, lineis incrementi obliquis arcuatis leviter striati, ultimus ad peripheriam rotundatus; apertura oblique lunata; peristoma tenue, margine columellari ad insertionem late dilatato et reflexo.*

*Diam. maj.  $11\frac{1}{2}$  millim., min. 10, alt. 7.*

*Hab.* Mount Chiradzulu.

More solid and more depressed than *T. nyikana*, with a wider umbilicus, and smaller aperture and body-whorl.



## 16. THAPSIA NYIKANA, sp. nov. (Plate XXXIII. figs. 24, 25.)

*Testa orbicularis, depressa, anguste umbilicata, tenuis, subpellucido-cornea, nitida, lineis incrementi leviter subplicatis sculpta; spira breviter conoidea, ad apicem obtusa; anfractus 5, convexi, lente accrescentes, infra suturam impresso marginati; apertura oblique lunata; peristoma tenue, margine columellari ad insertionem breviter expanso et reflexo, albo, umbilicum haud tegente.*

*Diam. maj. 12 millim., min. 10½, alt. 8.*

*Hab.* Nyika Range, 7000 feet.

The largest of the genus now described. The species cannot be identified except by actual comparison, figures and descriptions being of very little use.

## 17. THAPSIA DECEPTA, sp. nov. (Plate XXXIII. figs. 26, 27, 28.)

*Testa T. masukuensi similis, sed minor, latius perforata, depressior; anfractibus quinque, magis celeriter crescentibus, ultimo (spiræ respondente) majori; margine columellari vix reflexo, minime incrassato vel expanso.*

*Diam. maj. 8½ millim., min. 7, alt. 4½.*

*Hab.* Masuku Plateau, 6000-7000 feet.

Quite distinct from *masukuensis*, although very like in colour and general appearance until closely compared.

## 18. ZINGIS WHYTEI, Smith. (Plate XXXIII. fig. 31.)

*Helix (Pella) whytei*, Smith, Proc. Zool. Soc. 1893, p. 634, pl. lix. figs. 3, 4.

*Hab.* Mount Chiradzulu.

Some of the specimens from this locality are larger than the types, the largest having a diameter of 25 millim.

## 19. ZINGIS JOHNSTONI, sp. nov. (Plate XXXIII. figs. 29, 30.)

*Testa depressa, anguste umbilicata, tenuissima, cornea, lineis duobus angustis rufis cincta, lineis incrementi tenuibus striisque spiralibus minutis sculpta; spira breviter conoidea, ad apicem obtusa; anfractus 5, regulariter, haud celeriter crescentes, convexi, ultimus ad peripheriam obtuse angulatus, haud descendens, infra vix concentricè striatus; apertura obliqua, lunata; peristoma tenue, margine columellari ad insertionem breviter reflexo.*

*Diam. maj. 16 millim., min. 13, alt. 10.*

*Hab.* Masuku Plateau, 6000-7000 feet.

Allied to *Z. episcopalis* Smith and *Z. radiolata* Martens.

## 20. MARTENSIA CONSOCIATA, sp. nov. (Plate XXXIII. figs. 32, 33, 34.)

*Testa depressa conoidea, umbilicata, tenuis, pallide cornea, striis incrementi obliquis tenuissimis confertis sculpta, infra striis concentricis conspicuis ornata; spira breviter conoidea, ad apicem obtusa; anfractus sex, lente accrescentes, convexi, sutura profunda sejuncti, supra sed ad suturam carina marginati*

*ultimus ad peripheriam acute angulatus et carinatus; apertura oblique angulato-lunata; peristoma tenue, margine columellari supra late expanso et reflexo.*

*Diam. maj. 12 millim., min. 10, alt. 7.*

*Hab.* Masuku Plateau, 6000-7000 feet.

More widely umbilicated than *M. mozambicensis*, less sharply keeled, much more delicately sculptured above, &c. The lower surface is more glossy than the upper, which has a silky appearance in nicely washed specimens.

21. *MARTENSIA MOZAMBICENSIS* Pfeiffer.

*Helix mozambicensis*, Pfr. Proc. Zool. Soc. 1855, p. 91, pl. xxxi. fig. 9; Martens, Weichth. Deutsch-Ost-Afrikas, p. 46, as *Martensia* (synonymy and references).

*Hab.* Masuku Plateau, 6000-7000 feet; Zomba Plateau, 5000 feet; Nyika Range, 7000 feet; Mount Chiradzulu.

Widely distributed in East Central Africa, and varying in height of spire, strength of sculpture, convexity of whorls, &c.

22. *PHASIS (TRACHYCYSTIS) FUSCO-CORNEA*, sp. nov. (Plate XXXIII. figs. 35, 36.)

*Testa depressa, orbicularis, mediocriter umbilicata, tenuis, pallide fusco-cornea, epidermide conspicue pilosa induta; spira fere plana, apice vix elato; anfractus  $4\frac{1}{2}$ , convexiusculi, sutura profunda sejuncti, sublente accrescentes, rugose striati et punctati, ultimus antice leviter descendens, ad peripheriam obtuse subangulatus; apertura obliqua, late lunata; peristoma tenue, margine columellari ad insertionem dilatato et leviter reflexo.*

*Diam. maj. 9 millim., min.  $7\frac{1}{2}$ , alt. 5.*

*Hab.* Zomba Plateau, 5000 feet.

The hairs of the periostracum are rather long, and when rubbed off the surface has a rough pitted appearance.

23. *PHASIS (TRACHYCYSTIS) FUSCO-OLIVACEA*, sp. nov. (Plate XXXIII. figs. 37, 38.)

*Testa P. fusco-corneæ similis, sed minor, fusco-olivacea, angustius umbilicata; anfractibus  $4\frac{1}{2}$ , minus convexis, sutura minus profundus sejunctis, ultimo vix descendente.*

*Diam. maj. 7 millim., min. 6, alt.  $3\frac{2}{3}$ .*

*Hab.* Masuku Plateau, 6000-7000 feet; Nyika Plateau, 7000 feet.

When the hairy periostracum is rubbed off, the surface above and below exhibits lines of growth and spiral striation.

24. *TROCHOZONITES SHARPEI*, sp. nov. (Plate XXXIII. fig. 39.)

*Testa elate conica, ad peripheriam carinata, anguste perforata, tenuis, nitida, flavescenti-cornea, lineis incrementi tenuibus obliquis sculpta; spira producta, subconcaeva, ad apicem obtusa; anfractus  $7\frac{1}{2}$ , lente accrescentes, apicales perconvexi, ceteri sensim minus rotundati, supra suturam filo-carinati, ultimus in medio*

*acute albo-carinatus, infra convexiusculus; apertura obliqua, angulato-lunata; peristoma tenue, margine columellari superne late reflexo, umbilicum semiobtegente.*

*Diam. maj.*  $8\frac{1}{2}$  millim., *min.* 8, *alt.* 9.

*Hab.* Mount Chiradzulu.

*Var. anfractibus convexioribus, ultimo ad peripheriam angustiore.*

*Hab.* Masuku Plateau, 6000–7000 feet.

25. *BULIMINUS (RHACHIS) STRICTUS* Martens.

*Bulimus (Rhachis) strictus*, Martens, Mal. Blätt. 1859, vol. vi. p. 211, pl. ii. fig. 6.

*Hab.* Nyasaland (*Kirk and Whyte*); Tette, Mozambique (*Martens*).

Of four specimens from Nyasaland only one has the two pale rosy bands of the type. Martens describes the four apical whorls as uniformly yellow, whereas all the specimens I have examined have in these whorls a black zone just above the suture.

26. *BULIMINUS (RHACHIS) BÖHMI* Martens.

*Bulimus (Rhachis) böhmi*, Martens, Nachr. Deutsch. mal. Gesell. 1895, p. 181; Beschalte Weichth. Deutsch-Ost-Afrikas, p. 70, pl. iii. fig. 39.

*Hab.* Mount Chiradzulu, 5000 feet.

The specimens in the present collection are rather smaller than the type, which was obtained further north on the east side of Lake Tanganyika. The largest specimen is only 19 millim. in length.

27. *BULIMINUS (RHACHIS) CHIRADZULUENSIS*, sp. nov. (Plate XXXIII. fig. 40.)

*Testa ovato-conica, tenuis, vix perforata, straminea, lineis duabus fuscis circa medium anfractus ultimi ornata, nitens, lineis incrementi tenuibus obliquis striata; spira conica, versus apicem mediocriter obtusum sordide rufescens; anfractus sex, convexiusculi, ultimus in regione umbilici pellucidus; apertura irregulariter ovata, longit. totius  $\frac{1}{2}$  æquans; intus bilineata; peristoma tenue, margine columellari anguste reflexo, appresso, rimam inconspicuum formante.*

*Longit.*  $13\frac{1}{2}$  millim., *diam.*  $8\frac{3}{4}$ .

*Hab.* Mount Chiradzulu.

Allied to *B. usagicus* Smith, but thinner, yellower, with a narrower perforation and a differently reflexed columella. I cannot agree with Dr. von Martens in considering *B. usagicus* a variety of *B. melanaeme* of Pfeiffer.

28. *BULIMINUS (CONULINUS) NYASANUS*, sp. nov. (Plate XXXIII. figs. 41, 42.)

*Testa globoso-ovata, tenuis, umbilicata, pallide fuscescens, subpellucida, oblique tenuiter costulato-striata; spira conica, ad apicem subplana; anfractus 6, superiores  $2\frac{1}{2}$  (protoconcham formantes) convexiusculi, spiraliter fortiter lirati, cæteri convexi, ultimus globosus, haud descendens; apertura subperpendicularis,*



*longit. tolius*  $\frac{4}{5}$  *æquans*; *peristoma tenue, simplex, margine columellari reflexo, umbilicum mediocrem partim obtegente.*

*Longit.* 21 millim., *diam.* 15; *apertura* 12 *longa*, 7 *lata.*

*Hab.* Nyika Plateau, 7000 feet, Mount Chiradzulu and Zomba Plateau, 5000 feet.

Remarkable on account of the spirally lirate protoconch, the difference of sculpture of the normal whorls being sharply defined.

29. *BULIMINUS (CONULINUS) METULOIDES*, sp. nov. (Plate XXXIII. fig. 43.)

*Testa conica, anguste umbilicata, tenuis, pallide fusco-cornea, nitida, oblique tenuiter striata, ad apicem obtusa; anfractus 6-7, rotundati, regulariter accrescentes, sutura leviter obliqua sejuncti; apertura fere perpendicularis; peristoma tenue, simplex, margine columellari expanso et reflexo, umbilicum semiobtegente.*

*Longit.* 10 millim., *diam.* 6.

*Hab.* Zomba Plateau, 5000 feet.

Closely allied to *B. metula* Martens<sup>1</sup>, but, although larger, consisting of fewer whorls. Professor v. Martens writes concerning specimens sent for his examination:—"Very near to my *metula*, but a little broader and lower than all my specimens. Also the umbilicus is a little broader in my examples."

30. *BULIMINUS BOIVINI* (Morelet).

*Glandina boivini*, Morelet, Séries Conch. p. 72, pl. v. fig. 5.

*Bulimus (Cerastes) mamboiensis*, Smith, Ann. Mag. Nat. Hist. 1890, vol. vi. p. 153, pl. v. fig. 7.

*Hab.* Nyika Range, 7000 ft., Mount Chiradzulu, 6000-7000 ft., Masuku Plateau, 6000-7000 ft., Malosa, 6000 ft., Zomba Plateau, 5000 ft.

This species is very variable in size and form judging from the series of specimens from the above localities. It also has a wide range, the type being found to the north at Mombasa.

Dr. E. von Martens<sup>2</sup> has erroneously placed the *Buliminus ptychaxis* as a synonym of this species, which does not possess the distinct columellar fold which is characteristic of that form from Ujiji.

The following measurements will show the great variation in size which occurs in the present species:—

	Length.	Width.	Length of aperture.
	mm.	mm.	mm.
(1).....	25	10	9
(2).....	20	10	8
(3).....	14	7 $\frac{1}{2}$	6

Number 1 consists of 8 $\frac{1}{2}$  whorls, no. 2 of 7 $\frac{1}{2}$  whorls, and no. 3 of 6 $\frac{1}{2}$ , all appearing equally adult.

<sup>1</sup> Weichth. Deutsch-Ost-Afrikas, p. 66, pl. iii. fig. 27.

<sup>2</sup> Beschalte Weichth. Deutsch-Ost-Afrikas, p. 61.

31. *CURVELLA NYASANA*, sp. nov. (Plate XXXIII. fig. 44.)

*Testa elongata, ovato-conoidea, albida, subpellucida, anguste umbilicata, lineis incrementi valde curvatis costuliformibus sculpta; spira elongato-conica, ad apicem obtusa; anfractus 6-6½, convexiusculi, regulariter lente crescentes, sutura leviter obliqua sejuncti; apertura ovata, superne acuminata, longit. totius ½ subæquans; peristoma tenue, margine dextro in medio prominente curvato, ad suturam valde recedente, columellari obliquo, valde expanso et reflexo.*

*Longit.* 12½ millim., *diam.* 6½; *apertura* 6 longa, 3 lata.

*Hab.* Mount Chiradzulu, Masuku Plateau, 6000-7000 feet; Nyika Range, 7000 feet.

*Var. Testa typo major, latior, spira brevior, anfractibus superioribus brevioribus. Longit.* 18½ millim., *diam.* 11.

*Hab.* Zomba Plateau, 5000 feet.

This species may prove to be the same as *Hapulus conoideus* of Martens<sup>1</sup>, but, judging from the figures, it seems to be longer and narrower, with a more produced and less pointed spire.

32. *CURVELLA WHYTEI*, sp. nov. (Plate XXXIII. fig. 45.)

*Testa elongata, ad apicem obtusa, imperforata, tenuis, pallide straminea, nitida, tenuissime arcuatim striata; anfractus 6-7, convexiusculi, sutura obliqua sejuncti, ultimus elongatus; apertura perpendicularis, inverse auriformis; peristoma tenue, simplex, margine columellari reflexo, appresso, dextro prominente, curvato.*

*Longit.* 12½ millim., *diam.* 4½; *apertura* 4½ longa, 2 lata.

*Hab.* Mount Chiradzulu and Zomba Plateau, 5000 feet.

Martens writes concerning this species:—"Distinct from all my species by its slender form; *C. delicata* the nearest, but also somewhat broader than yours."

33. *SUBULINA CHIRADZULUENSIS*, sp. nov. (Plate XXXIII. fig. 46.)

*Testa elongata, imperforata, pallide cornea, tenuis, subpellucida, lineis incrementi tenuibus obliquis striata, nitida; spira medio-criter acuminata, ad apicem submamillata; anfractus 9, sensim crescentes, leniter convexi, infra suturam linea angusta pellucida marginati; apertura inverse auriformis, longit. totius ¼ paulo superans; columella arcuata, antice oblique truncata; labrum simplex, tenue.*

*Longit.* 18 millim., *diam.* 5.

*Hab.* Mount Chiradzulu.

Allied to *S. subcrenata* Martens. The lines of growth somewhat strong below the suture, producing a subcrenulated appearance. Prof. Dr. E. von Martens (*in litt.*) informs me that

<sup>1</sup> Beschalte Weichthiere Deutsch-Ost-Afrikas, p. 129, pl. v. fig. 14.

it is distinct from all he has described, but comes near his *S. pinguis*, being distinguished by its broader whorls and the different form of the upper part of the spire.

34. *SUCCINEA* sp. inc.

*Hab.* Mount Chiradzulu.

One dead specimen.

35. *ACHATINA IMMACULATA* Lamarck, var.

*Achatina immaculata*, Lamarck ; Férussac, Hist. Nat. Moll. pl. cxxvii.

*Hab.* Nyasaland.

None of the specimens hitherto examined are quite like Férussac's figure, in which the aperture is unusually long. The spire also is less conical than in specimens from Cape Delagoa in the British Museum or in the specimens from Nyasaland. The latter have the columella bluish white instead of pinkish, and are of a darker colour, but otherwise are fairly normal. *A. layardi* Pfeiffer is a variety of this species, rather more profusely spotted than the type.

36. *ACHATINA PANTHERA* (Férussac). (Plate XXXIV. fig. 1.)

*Achatina panthera*, Férussac ; Reeve, Conch. Icon. fig. 12.

*Hab.* Zomba.

The specimens from this locality are small and rather slender in comparison with the typical form figured by Férussac (Hist. Nat. Moll. pl. 126). The largest specimen is only 125 millim. in length, although consisting of  $8\frac{1}{2}$  whorls, the number possessed by a large typical example from Mozambique 157 millim. long. A very small specimen, which probably would not have grown larger, has a length of only 93 millim.

37. *ACHATINA GLUTINOSA* Pfeiffer.

*Achatina glutinosa*, Pfeiffer, Conch.-Cab. ed. 2, p. 360, pl. xlv. fig. 1.

*Achatina petersi*, Martens, Novitat. Conch. vol. iii. p. 452, pl. xcix. figs. 13-15.

*Hab.* Zomba.

I am unable to find any distinguishing characters between this species, said to have been originally obtained in West Africa, and *A. petersi* from Mozambique; and I am of opinion that the locality "W. Africa" is one of the many errors of this kind occurring in Mr. Cuming's collection. The species is remarkably constant in coloration, but varies somewhat in ventricosity. The type is 97 millim. in length and 49 in diameter, whereas a more ventricose specimen is the same length, but 6 millim. broader. A smaller but adult example from Zomba (88 millim. long and 45 wide) is rather more solid than the typical form.

38. *ACHATINA HAMILLEI* Petit.

*Achatina hamillei*, Petit, Journ. de Conch. 1859, p. 384, pl. xiii. fig. 3; Smith, Proc. Zool. Soc. 1881, p. 282, pl. xxxiii. fig. 10.

*Hab.* Nyasaland (*H. H. Johnston*); Usambara (*Kirk*); Zanzibar, Tanga, &c. (*Martens*).

39. *ACHATINA CRAVENI* Smith. (Plate XXXV. figs. 1, 2.)

*Achatina kirkii*, Smith, Ann. Mag. Nat. Hist. 1880, vol. vi. p. 428 (name preoccupied).

*Achatina craveni*, Smith, Proc. Zool. Soc. 1881, p. 283, pl. xxxiii. fig. 11; Martens, Weichth. Deutsch-Ost-Afrikas, p. 91.

*Hab.* Nyika Plateau, 6000–7000 feet, and Malosa, Nyasaland, 6000 feet.

These specimens are rather more coarsely sculptured than the type, and some have the stripes more zigzag than as represented in the cited figure. On the contrary, other specimens are uniformly greenish yellow without any striping at all.

40. *ACHATINA GLAUCINA*. (Plate XXXIV. figs. 2, 3.)

*Achatina glaucina*, Ancy, MSS.

*Testa ovato-fusiformis, flavescens vel rufescens, concolor, vel interdum supra spiram strigis rufis obliquis undulatis obscure picta; spira conica, ad apicem obtusa, lateribus convexiusculis; anfractus 8, lente accrescentes, convexiusculi, superiores tres læves, cæteri granulati, granulæ in anfr. ultimo infra medium plus minus obsolete; apertura glaucina vel cæruleo-albida, in exemplis adultis longit. totius  $\frac{1}{2}$  haud æquans, inverse auriformis; columella alba, leviter torta, anguste oblique truncata.*

*Longit.* 66 millim., *diam. maj.* 29; *apertura* 30 longa, 16 lata.

*Hab.* Zomba.

A smaller species than *A. johnstoni*, with a less tapering and shorter spire, narrower whorls, and rather finer granulation. The colour varies from uniform greenish yellow to rich brown, but some specimens, chiefly of the latter variety, exhibit reddish striping upon the spire. This kind of ornamentation, however, does not appear to extend to the last volution.

41. *ACHATINA JOHNSTONI*, sp. nov. (Plate XXXIV. figs. 4, 5.)

*Testa ovato-fusiformis, flavescens, concolor, vel strigis undulatis vel zigzagformibus saturate rufo-castaneis picta; spira elongata, ad apicem obtusa; anfractus 9, superiores tres læves, convexiusculi, cæteri convexi, incrementi lineis obliquis fortibus striisque spiralibus numerosis ruditer granulati, ultimus infra medium granulæ fere evanidis; apertura parva, inverse auriformis, cæruleo-alba, strigis externis translucens; columella leviter arcuata vel rectiuscula, infra ad marginem alba, oblique truncata.*

*Longit.* 79 millim., *diam. maj.* 40 ; *apertura* 35 longa, 19 lata.

*Hab.* Nyasaland.

The principal distinguishing features of this fine species are the prolonged spire, the general form, and coarse granulation. As in some other species, two varieties of coloration occur in the present form. Some are white, clothed with a glossy yellowish epidermis, here and there varied with darker oblique stripes, indicating periods of growth. Other examples, however, are adorned with more or less oblique dark reddish-brown wavy or zigzag-like stripes, which are slender above, becoming broader below. Those on the body-whorl coalesce inferiorly and form a rich brown patch at the base or anterior end. The coarse granulation practically ceases at the periphery, the spiral striæ becoming less pronounced below.

42. *ACHATINA FRAGILIS*, sp. nov. (Plate XXXV. figs. 3, 4.)

*Testa ovata, supra acuminata, tenuissima, subpellucida, flavo-olivacea, concolor, vel rufo strigata; spira brevis, conica, ad apicem subobtusa; anfractus 6-7, convexi, superiores 3 pallidi, leves, duo sequentes incrementi lineis striis spiritalibus decussatis granose sculpti, ultimus magnus, inflatus, infra medium haud granulatus, lineis incrementi obliquis curvatis fortibus ornatus; apertura inverse auriformis, cærulescens, nitens; columella leviter arcuata, tenuis, callo tenuissimo induta, antice anguste truncata; labrum tenuissimum, nigro marginatum.*

*Longit.* 75 millim., *diam.* 43 ; *apertura* 47 longa, 26 lata.

*Hab.* Nyika Plateau, 6000-7000 feet.

This species is remarkable on account of its extreme thinness and lightness. Some specimens are uniformly yellowish olive, with here and there a darker stripe, marking a period of growth, whilst others, having the same ground-colour, are ornamented with numerous oblique and slightly wavy red stripes. These either extend the whole length of the body-whorl, or occasionally disappear upon the lower half. The somewhat coarse regular granulation ceases a little above the middle, but a few transverse striæ, not sufficient to form a regular granulation of the surface, are traceable below.

43. *CYCLOPHORUS (HIJABIA) INTERMEDIUS* Martens.

*Cyclophorus intermedius*, Martens,  $\frac{1}{2}$  Weichth. Deutsch-Ost-Afrikas, p. 8, pl. ii. fig. 3.

*Hab.* Masuku Plateau, 6000-7000 feet.

Closely allied to *C. (Hijabia) wahlbergi* Krauss, from Natal, but with the spire rather more elevated.

44. *POMATIAS NYASANUS*, sp. nov. (Plate XXXV. fig. 5.)

*Testa subglobosa, turbinata, mediocriter umbilicata, pallide rufescens, zona infra peripheriam nigro-purpurea cincta, strigis obscuris arcuatis lividis in anfractu ultimo longitudinaliter picta,*



*spiraliter undique tenuiter lirata lineisque incrementi tenuissimis sculpta; anfractus 5, convexi, superiores duo laeves, ultimus antice paulo descendens; apertura subcircularis, longit. totius  $\frac{1}{2}$  superans, intus rufo-fuscescens, zona nigro-purpurea picta, lineis saturate fuscis supra obscure ornata; peristoma albidum, margine dextro vix expanso, columellari subreflexo.*

*Diam. maj. 21 millim., min. 16, alt. 20; apertura 10 longa, 9 lata.*

*Hab.* Mount Chiradzulu; Nyika Range, 7000 feet, and Zomba Plateau, 5000 feet.

Allied to *P. [Cyclostoma] insularis* Pfeiffer from Natal, but more widely umbilicated, with more convex whorls, more numerous and finer spiral liræ, and without the second purplish-black zone upon the upper part of the body-whorl which revolves up the spire. The outer margin of the aperture also is less expanded.

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